



Elizabeth Lawrence

Manager, State Regulatory Strategy
and Compliance

Mail Station 9708
PO Box 53999
Phoenix, Arizona 85072-3999
Tel 602-250-3784
Elizabeth.Lawrence@aps.com

September 15, 2022

Docket Control
ARIZONA CORPORATION COMMISSION
1200 West Washington Street
Phoenix, AZ 85007

RE: Arizona Public Service Company (APS or Company)
2022 Transportation Electrification (TE) Mid-Year Progress Report
Docket No. E-00000A-21-0104

Decision No. 78383 (Dec. 28, 2021) provides that "[APS] shall file semi-annual progress reports with the Commission detailing the status and implementation of the plan, by March 15 and September 15 of each year."

Accordingly, APS submits its 2022 TE Mid-Year Progress Report in compliance with the above-referenced decision.

Please let me know if you have questions.

Sincerely,

/s/ Elizabeth Lawrence

Elizabeth Lawrence

EL/me
Attachments

cc: Elijah Abinah
Barbara Keene
Cameron Nance
Ranelle Paladino

ARIZONA PUBLIC SERVICE COMPANY

Transportation Electrification 2022 Mid-Year Progress Report

September 15, 2022

I. Table of Contents

II. Introduction	3
III. EV Adoption and Forecast	3
IV. Public Charging Ports	5
V. APS TE Infrastructure Programs	5
1. Take Charge Arizona Pilot Program – Commercial Level 2	5
2. Take Charge Arizona Pilot Program – Direct Current Fast Charging (DCFC) ..	7
VI. APS EV Demand Side Management (DSM) Programs	7
1. APS SmartCharge Program	8
2. Residential Smart Charger Rebate	10
VII. Chargeway	10
VIII. Program Budget	10
IX. TE Collaborative Meetings	10
X. Municipal Fleet Electrification	11
XI. Customer Experience	11
XII. Environmental	11
XIII. Customer Rate Plans	11
XIV. APS Transportation Fleet Electrification.....	12

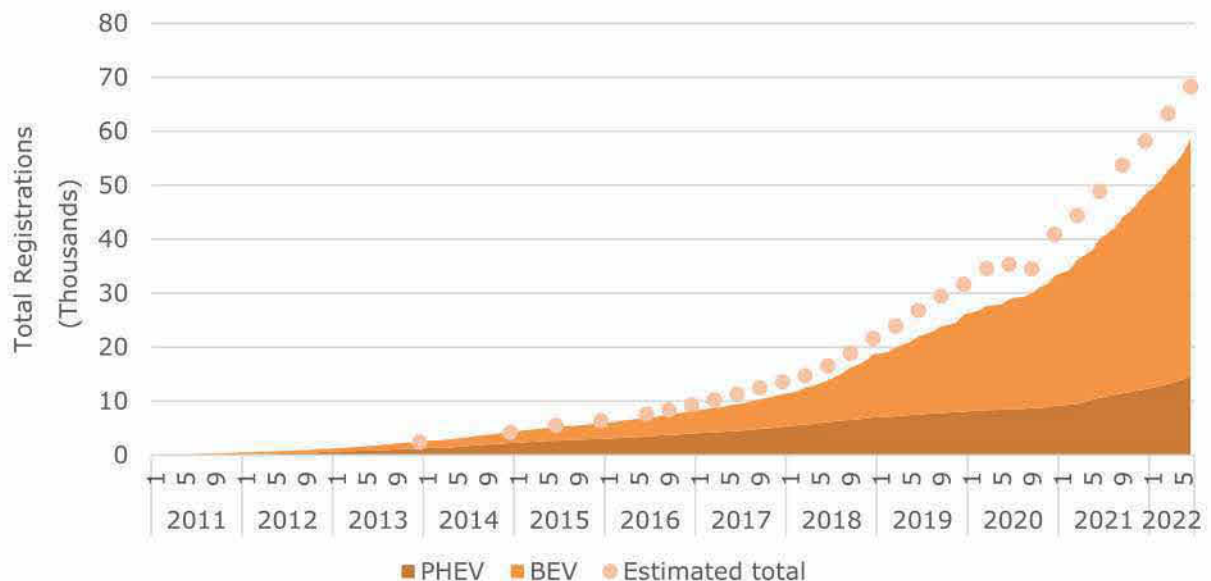
II. Introduction

Arizona Public Service Company (APS or Company) is filing the Transportation Electrification (TE) Mid-Year progress report in accordance with Arizona Corporation Commission (ACC or Commission) Decision No. 77289 (July 19, 2019) and Decision No. 78383 (December 28, 2021). This report includes information on all active APS TE initiatives with highlights during the January 1 – June 31, 2022, reporting period.

III. EV Adoption and Forecast

The light-duty EV market is still growing despite manufacturing challenges and supply chain constraints in recent years. According to the Electric Power Research Institute (EPRI), there will be approximately 140 new plug-in EV models available by 2024.¹ At the end of June 2022, the estimated number of EVs, including plug-in hybrid electric vehicles (PHEV) and battery electric vehicles (BEV), in Arizona and APS's service territory is 68,201 and 31,149, respectively (EPRI, 2022). Both totals represent a nearly 40% increase in vehicle registration over the same period last calendar year. Furthermore, it is forecasted that there will be just over 260,000 EVs in APS's service territory in 2030 according to the Strong Market Transformation (SMT) scenario from Guidehouse (GH).² The following charts depict estimated light-duty EV adoption and forecast for APS's service territory (Figure 1 – 4).

Figure 1: Arizona EV Registrations



¹ EPRI, June 2022. Retrieved from EPRI Program 18 – Electric Transportation.

² Forecast based on the Guidehouse (GH) Strong Market Transformation (SMT) scenario developed for APS in 2019 and used in APS's Resource Plan to forecast energy demand from EVs. Guidehouse also developed three additional forecasts referred to as Business as Usual (BAU) Low, Medium, and High (See Figure 3). The GH SMT Forecast assumes that battery costs decrease and that gasoline prices, mode availability, and EV marketing increase.

Figure 2: APS Territory EV Registrations

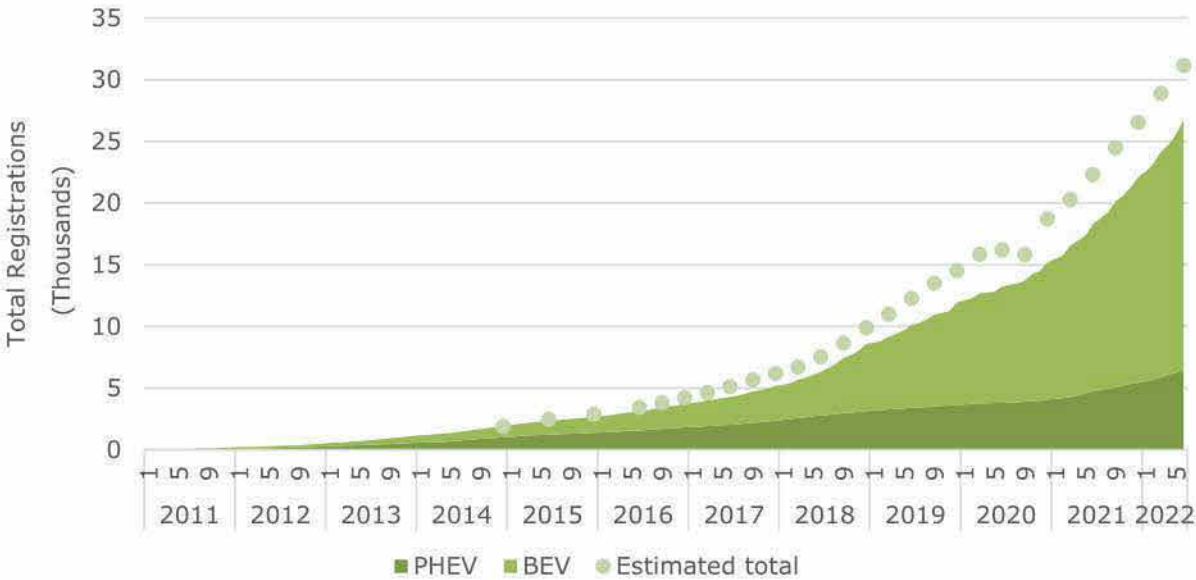


Figure 3: APS Territory Light-Duty EV Forecast

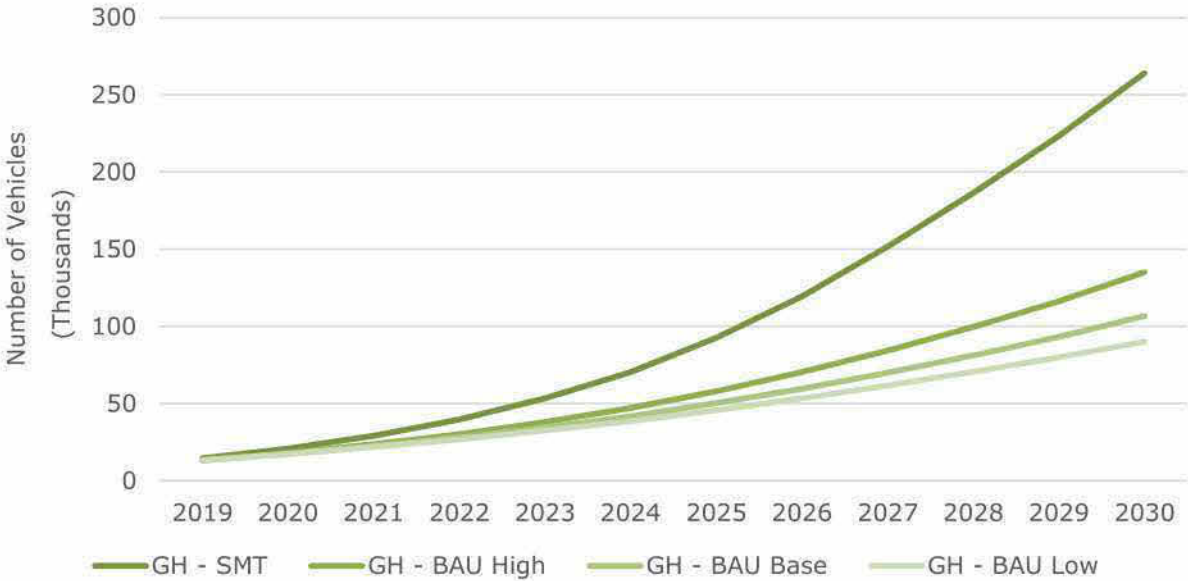


Figure 4: Light-Duty EV Adoption in APS Service Territory

Current EV Adoption	2030 GH SMT Forecast ¹	Progress Towards GH SMT Forecast	2030 Statewide TE Plan Target ²	Progress Towards Statewide TE Plan Target
31,149	264,041	11.8%	450,000	6.9%

IV. Public Charging Ports

There are 2,901 public charging ports in Arizona with APS's service territory containing 23% of all Level 2 and 43% of all DCFC ports in operation in Arizona as of June 30, 2022 (PlugShare, 2022). The following tables summarize the public charging port count for Arizona and APS's service territory (Figures 5 – 6).

Figure 5: Public Charging Port Count³

Port Type	Arizona	APS Territory
Level 2	2,275	529
DCFC	626	272

Figure 6: Public Charging Port to EV Ratio⁴

Port Type	Arizona	APS Territory
Level 2 Ports	1:30	1:59
DCFC	1:109	1:115

V. APS TE Infrastructure Programs

1. Take Charge Arizona Pilot Program – Commercial Level 2

APS initiated the Take Charge AZ pilot program (TCAZ) in November 2018 to encourage EV adoption by providing L2 charging stations in the Company's service territory. Through the program, APS installs, owns, and maintains the EV charging equipment for five years. After five years, customers have the option to keep the equipment or have it removed at no cost to the customer. During the reporting period, 180 L2 ports were energized bringing the total ports energized to 602 as of June 30, 2022 (Figure 7). 38% of the ports energized are with the following customer classes: municipality or government, non-profit, multi-unit dwellings (MUDs), and education (Figure 8). Also, 65% of ports installed are in low-income areas classified above the 50th percentile and 39% above the 70th percentile (Figure 9). Lastly, ports have been energized in 9 counties, 39% of which are outside of Maricopa County (Figure 10).

¹ Guidehouse (GH) Strong Market Transformation (SMT) Forecast, 2019. Developed for APS and used in APS's Resource Plan to forecast EV energy demand.

² Statewide TE Plan, 2019. Retrieved from <https://docket.images.azcc.gov/E000012626.pdf?i=1642097136773>.

³ Public Charging Port Count retrieved from PlugShare as of the month of June, 2022.

⁴ Ratio developed using Current EV Adoption and Public Charging Port Count values for Arizona and APS Territory, rounded up to the nearest whole number.

Figure 7: Ports Energized

During Reporting Period		Total	
Ports Energized	Customers Added to Waitlist	Ports Energized	Customers Added to Waitlist
180	61	602	144

Figure 9: Total Share of L2 Ports Energized in Low Income Areas

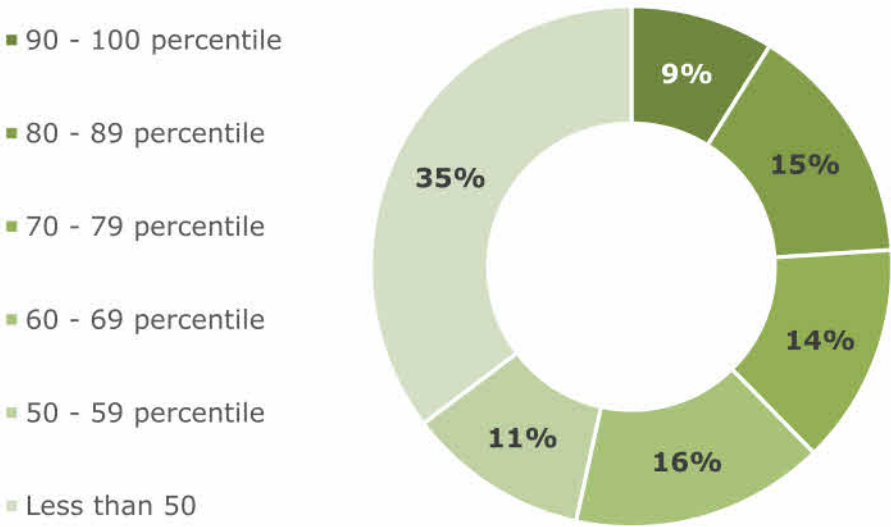


Figure 8: Total Share of L2 Ports Energized by Customer Type

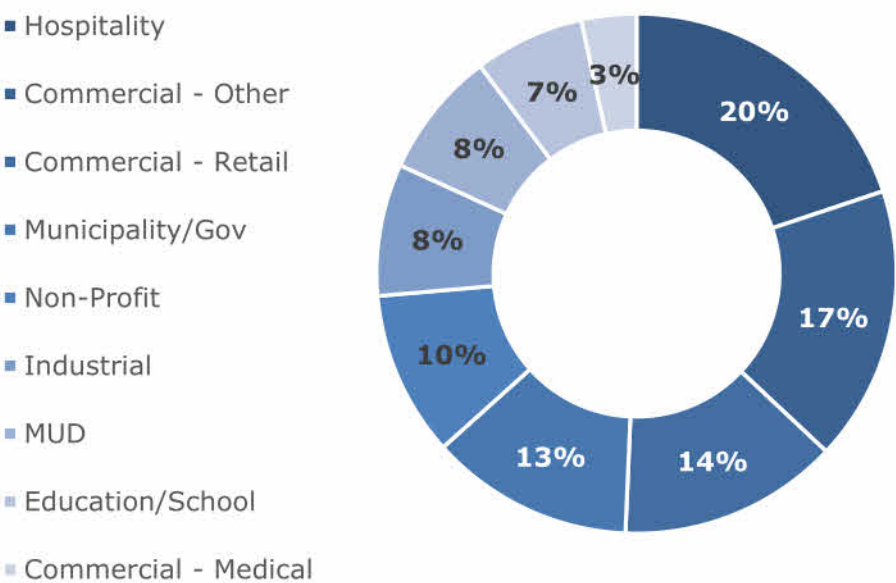
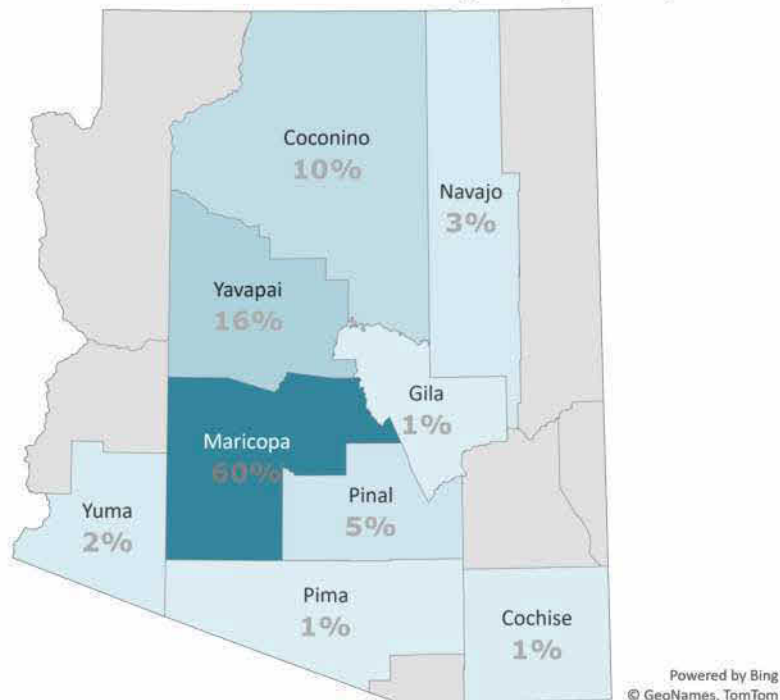


Figure 10: Total Share of L2 Ports Energized by County



2. Take Charge Arizona Pilot Program – Direct Current Fast Charging (DCFC)

APS's partnership with Electrify America to deploy DCFC stations in strategic areas throughout the Company's service territory is well underway. During the reporting period, APS energized the first DCFC station as part of this partnership located at City Hall in Show Low, Arizona. Additional sites in the communities of Globe, Payson, Prescott, and Sedona, Arizona are expected to be energized by the end of 2022.

- Prescott - Yavapai College
- Sedona - Posse Grounds Park
- Payson - Payson Rim Country Mall
- Globe - Chalo's Casa Reynoso

Each location will have one charging plaza with up to four individual DCFC stations. These stations will be designed with future technology changes in mind to accommodate increases in EV battery charging capacity, using equipment that delivers DCFC rates ranging from 150 kW to 350 kW.

VI. APS EV Demand Side Management (DSM) Programs

The EV Charging Demand Management Pilot Program is intended to proactively address the growing electric demand from EV charging as EVs become more widely adopted. The pilot will target EV owners in the APS service territory, including residential customers with individual passenger vehicles, as well as commercial vehicle fleets, where applicable.

1. APS SmartCharge Program

The APS SmartCharge program launched on November 1, 2021, and encourages EV owners to share data on their driving and charging behavior by either installing a data-sharing module in the diagnostic port of their car or granting permission to share their car account data using an application programming interface (API) with the implementer. SmartCharge participants receive a \$25 sign up incentive and \$5 per month incentive for providing ongoing data.

Based on the data collected during the reporting period, 78% of residential EV charging (kWh) occurs at Level 2 chargers, followed by DCFC and then Level 1 chargers (Figure 11). Additionally, most of the charging occurs post peak and in the morning hours, which makes up 76% of charging energy (kWh). This is followed by 15% of EV charging occurring midday during peak solar hours, with only 9% occurring during peak (Figure 12).

The data and corresponding EV charging load shapes indicate that residential customers are very responsive to their home TOU rate. The data shows for home charging, which makes up 73% of all EV charging, most customers schedule their EV to charge off-peak. Home EV charging begins to increase after 8:00 p.m. and peaks at 10:00 p.m. (Figure 13). For away from home charging, which makes up 27% of EV charging, the program data shows a majority of charging occurs midday and is nearly equally split between DCFC and Level 2 (Figure 14). The charts below summarize the EV charging data from the APS SmartCharge program for all program participants (696 EVs as of June 30, 2022).

Figure 11: Percent Home EV Charging (kWh) by Charge Level



Figure 12: Percent Home EV Charging by Time Period

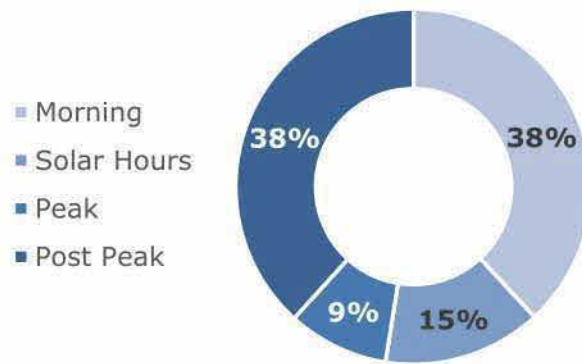


Figure 13: EV Charging by Time of Day - Home

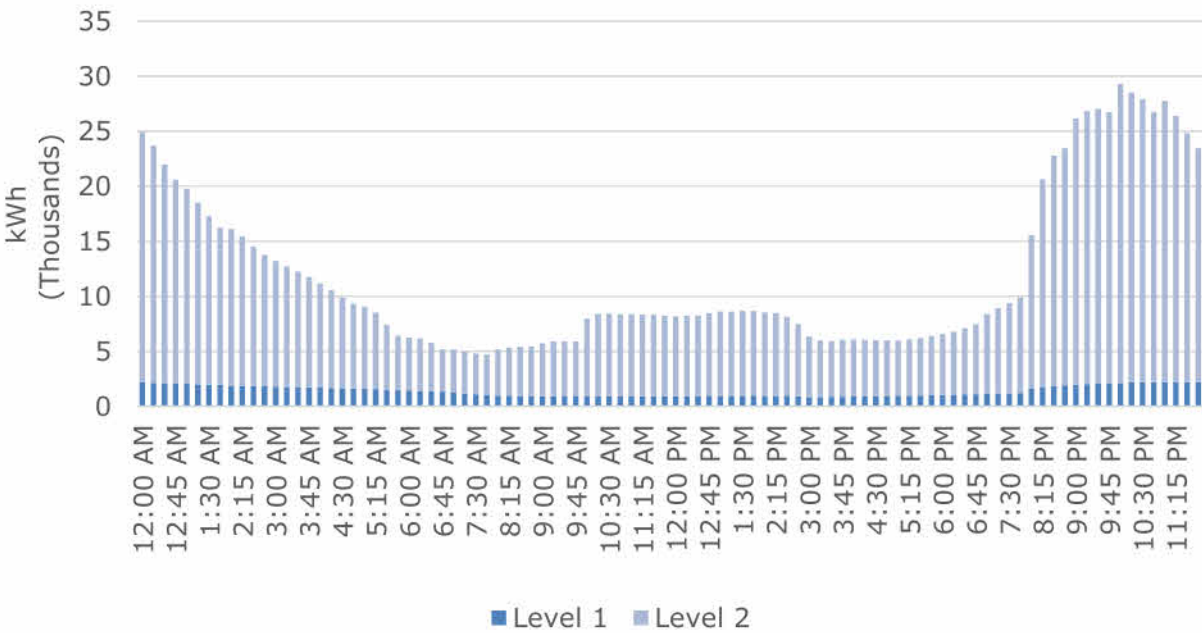
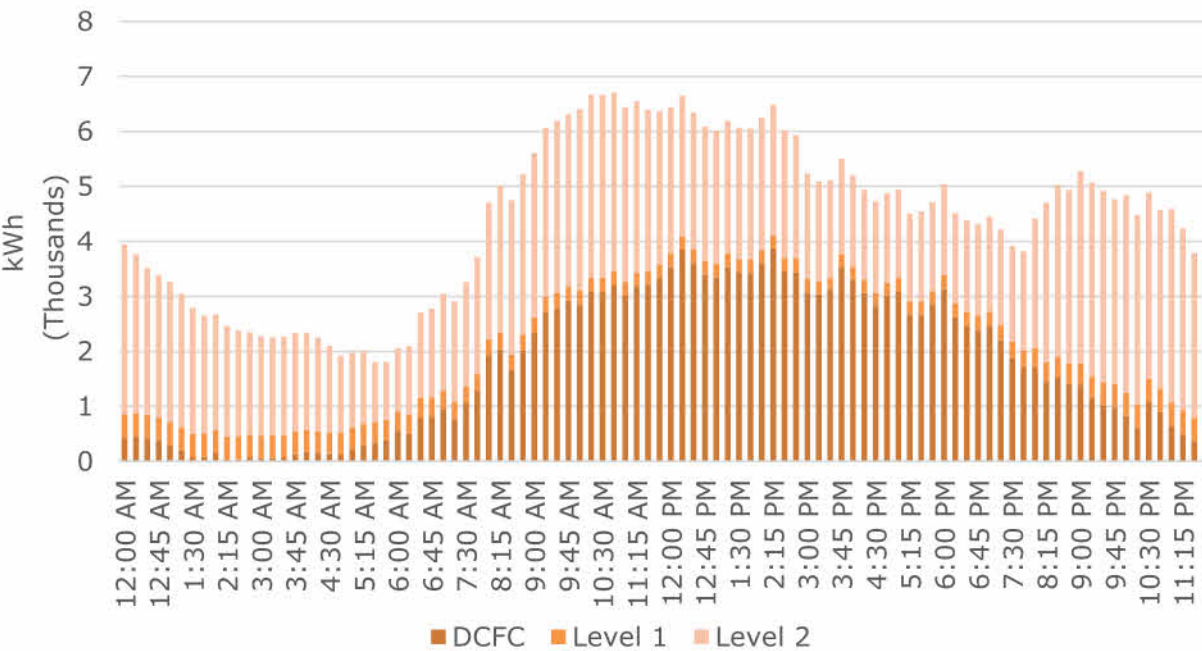


Figure 14: EV Charging by Time of Day - Away



2. Residential Smart Charger Rebate

As part of the EV Demand Management Pilot Program, APS offers a \$250 rebate to customers that purchase a new connected smart charger (EV Smart Charger Rebate). Rebates for qualifying smart chargers can be claimed on the APS online Marketplace using an online rebate process. In total, 194 rebates were administered during the reporting period.

Additional results of the EV Charging Demand Management pilot program can be found in APS's DSM Annual Progress Report filed on March 1, 2022, and DSM Status Report filed September 1, 2022, in Docket No. E-00000U-18-0055.

VII. Chargeway

APS launched a partnership in 2021 with Chargeway, a company focused on EV charging education and outreach with dealerships and consumers. APS deployed six Chargeway Beacons at dealerships across APS's service territory. Chargeway Beacons are large touch-screen kiosks that serve as a tool for educating dealership sales staff and prospective EV buyers about EVs, available incentives, route planning, chargers, fuel savings, and utility programs. During the reporting period, the Chargeway Beacons experienced 31,508 interactions, averaging 31 interactions daily between March and June 2022. In addition to the Beacons, Chargeway has a mobile app to help consumers navigate EV charging in a simplified way. During this reporting period, a total of 330 users downloaded the mobile app with a 66% increase in downloads from Q1 2022 to Q2 2022.

VIII. Program Budget

As of June 30, 2022, APS has not filed a budget with the Commission pertaining to the Company's TE infrastructure programs. APS will file a budget as part of the 2023 TE Plan and Budget supplemental filing later this year in conjunction with the Company's 2023 DSM Plan. APS provided budget and spend information for its TE programs that are part of the DSM Plan in the Company's DSM Annual Progress Report filed on March 1, 2022 and DSM Status Report filed September 1, 2022 (Docket No. E-00000U-18-0055).

IX. TE Collaborative Meetings

APS hosts TE Collaborative meetings with industry stakeholders a minimum of four times per year. APS has hosted six meetings with stakeholders since the TE Collaborative was created in late 2021, three of which were held during this reporting period. Summaries of each meeting are filed with the Commission shortly after they take place. The dates the TE Collaborative meetings were held are:

- March 4, 2022
- March 31, 2022
- May 26, 2022

The TE collaborative meetings were attended by the following stakeholders:

- Alliance for Transportation Electrification
- Arizona PIRG Education Fund
- ChargePoint
- City of Phoenix
- Clean Air AZ (Valley of the Sun Clean Cities Coalition)
- Commission Staff
- Electrify America
- Energy Hub
- Earthjustice
- EVgo
- Flo
- Free Wire Technologies
- Lubin & Enoch
- Nuvve
- RUCO
- SWEEP
- Tesla
- TEP
- Tierra Strategy
- WRA
- WeaveGrid

X. Municipal Fleet Electrification

APS does not currently have access to the number of municipalities that are working to electrify their fleets; however, the Company is working with a few municipalities on these opportunities through its TE Collaboratives, including the City of Phoenix, City of Scottsdale, and City of Avondale, as well as separately with the City of Flagstaff. For example, the City of Flagstaff is working to implement their TE plans, and APS is supporting these initiatives by collaborating on EV charging equipment, charging schedules, and exploring creative solutions that optimize their electric fleets. APS will continue to partner with the municipalities and companies within its service territory to help interested parties meet their fleet electrification goals.

XI. Customer Experience

APS's EV programs are in early stages of implementation. APS will perform customer experience surveys to evaluate its EV programs and will include results in future reports as the Company's EV programs mature.

XII. Environmental

All the counties in Arizona except for Maricopa County, Yuma County, and part of Pinal County are in attainment for the Ozone standard. For more information, please see Environmental Protection Agency (EPA) website at: <https://www3.epa.gov/airquality/greenbook/ancl.html>.

XIII. Customer Rate Plans

To date, APS does not have the ability to identify each customer in its territory with an EV in the home, aside from customers that have enrolled in EV specific programs, such as APS SmartCharge. The table below summarizes the rates that customers with EVs are on that are enrolled in the APS SmartCharge program, including the percentage of all residential customers on each corresponding rate.

Figure 15: Customer Rate Plans

Rate	Number of SmartCharge Customers on Rate	Percentage of SmartCharge Customers on Rate	Percentage of All Customers on Rate
Standard Energy Rates	86	17%	38.6%
Time-of-Use - Demand	213	43%	29.4%
Time-of-Use - Energy	201	40%	32%

In 2021, APS implemented a commercial DCFC Rate Rider, which is intended to support the growth of public fast charging in APS's service territory by reducing demand charges based on the load factor of public fast charging stations. During this reporting period, 11 customer accounts were added, with a total of 16 accounts taking advantage of the new rate rider.

XIV. APS Transportation Fleet Electrification¹

The APS fleet electrification goal is to transition 30% of all light-duty vehicles and equipment (including forklifts, UTVs/ATVs/Carts) to electric by 2025 with a stretch goal to be 100% carbon-free by 2050. The Company is also committed to transitioning medium- and heavy-duty vehicles and equipment once there are more commercially available options and upon retirement of current assets.

Figure 16: Current Status of Plug-in Hybrid, All-Electric Vehicles, and Equipment by Type

Equipment or Vehicle Type	Total Plug-in Hybrid/Electric	Percent Plug-in Hybrid/Electric
General Equipment ²	84	25%
Light-Duty Vehicles	23	6%
Medium- and Heavy-Duty Vehicles ³	0	0

¹ The data provided for the current status of the Company's fleet electrification is as of September 2022 (Figure 16), with projections extending 6 months beyond that month to March 2023 (Figure 17 and 18).

² Includes forklifts, ATVs/UTVs/Carts.

³ Medium- and heavy-duty options not yet commercially available or currently price prohibitive. In lieu of viable hybrid/electric options, the Company is leveraging jobsite idle-mitigation technology as a standard package for trouble trucks and has two Odyne bucket trucks with battery-assisted drivetrain and electric power takeoff (ePTO) systems.

Figure 17: Plug-in Hybrid and All-Electric Replacements Projected Within Next Six Months

Equipment or Vehicle Type	Total Projected Plug-in Hybrid Replacements	Total Projected Electric Replacements
General Equipment	0	9
Light-Duty Vehicles	0	7
Medium- and Heavy-Duty Vehicles	0	0

Figure 18: Estimated Expenses for Plug-in Hybrid and All-Electric Replacements Projected Within the Next Six Months

Equipment or Vehicle Type (Quantity)	Total Estimated Purchase Price	Total Estimated Annual Expenses	Expense Category
General Equipment (9 Forklifts)	\$1,007,938	\$45,000	92% Cap / 8% O&M
Light-Duty Vehicles (1 Sedan, 6 Trucks)	\$362,000	\$11,661	29% Cap / 71% O&M

Annual expense estimates include the cost of maintenance and electricity. Assumptions have been made based on industry research (i.e., EPRI) and historical results for APS vehicles and equipment. Actual EV results may vary based on usage and variables not yet known. APS will continue to refine these assumptions as the Company progresses in its fleet electrification strategy.

Given the relative infancy of the APS fleet electrification strategy and the limited data around the true performance of EVs within the APS fleet, it is too soon to estimate what the net operating expense and rate base impacts will be. However, the Company is committed to making prudent plug-in hybrid/EV replacement decisions at the end of each vehicle/equipment's natural lifecycle when affordable plug-in hybrid/EV options are available, viable and cost effective.